I10. Industrial and Food Microbiology and Biotechnology

P410. Production of an enzymatic cocktail by *Aspergillus awamori* grown on corn straw with stirred tank bioreactor

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Increased agroindustrial activity has led to the accumulation of large amounts of lignocellulosic material (LCM). LCM is nature's most abundant source of renewable carbon, representing a valuable industrial substrate with potential for many applications. Thus, the objective of this work was to screen for different holocellulases and to analyze the production of an *Aspergillus awamori* enzyme cocktail grown in corn straw (CS) using a stirred tank bioreactor. Screening was performed with *A. clavatus*, *A. flavus*, *A. terreus*, *A. niveus*, *A. awamori* and *A. brasiliensis* cultivated in minimal medium (MM), with 1% CS at 30 ºC or 37 ºC (for *A. niveus*), 120 rpm, for 5 days. Xylanase (XYN) and endoglucanase (EG) activities were evaluated by formation of reducing sugars using dinitrosalicylic acid (DNS). Cellobiohydrolase (CBH), β-glucosidase (BGL) and β-xylosidase (BXL) were determined by cleavage of PNP-β-D-cellobioside, PNP-β-D-glucopyranoside and PNP-β-D- xylopyranoside, respectively. After screening, a pre-inoculum was prepared with the best enzyme producer using a 500 mL MM flask and incubated at 30 °C, 120 rpm for 48 hours. The increase of enzyme production was performed in a Benchtop BioFlo 310 bioreactor, with 4.5 L of MM and 1% of CS, and was then inoculated the best enzyme producer. Cultivation was performed at 30 °C, pH 6.5, 275 rpm, air flow 2 v.v.m., for 5 days. During the screening, all fungi presented EG, CBH, BGL, XYN and BXL activities. However, *A. awamori* was chosen to continue the experiments because of its BXL activity which was 12.6 times higher than that produced by *A. niveus*. At the scale-up stage, XYN production (47.80 U/ mL) increased 4.1-fold compared to flask activity (11.52 U/mL). BXL also showed 1.6-times higher activity, as well as EG, CBH and BGL, which improved 2.3, 3.3 and 1.2 times their activities, respectively. It was concluded that the staggering of cocktail production improved the enzymatic activities and that corn straw is an excellent source of induction. Furthermore, this cocktail has the potential to be applied in the hydrolysis of different LCM due to the range of holocellulases present.

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